What is claimed is:

1 A liquid separator for a gas analyzer, said 2 liquid separator comprising:

a closed container including a sample inlet port, a sample outlet port, and a low pressure port;

said container defining a liquid collection chamber;

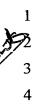
a liquid trap filter chamber integral with said container, said liquid trap filter chamber including an inlet compartment interposed between said sample inlet port and said sample outlet port for receiving a gas sample introduced into said sample inlet port, said inlet compartment having an upper outlet communicated with said sample outlet port and a lower outlet communicated with said liquid collection chamber; and

a liquid trap filter element contained in said inlet compartment interposed between said sample inlet port and said sample outlet port for separating liquid from the gas sample, liquid separated from the gas sample passing through said lower outlet to said collection chamber.

2. The liquid separator according to claim 1, wherein said inlet compartment includes a barrier interposed between said filter element and said sample outlet port, said barrier defining said upper outlet.

3. The liquid separator according to claim 2, wherein said liquid trap filter chamber includes a cover which encloses said filter element within said inlet compartment.

J. 6 /



1

2

3

4

5

7

8

9

10

- 4. The liquid separator according to claim 3, wherein said cover includes at least one concave filter engaging surface engaging said filter element to trap said filter element between said cover and said barrier.
- 5. The liquid separator according to claim 1,
 wherein said filter element comprises a membrane
 bearing a polytetrafluoroethylene laminate.
 - 6. The liquid separator according to claim 1, wherein said liquid trap filter chamber includes an outlet compartment interposed between said collection chamber and said low pressure port, said outlet compartment having an inlet communicated with said collection chamber and an outlet communicated with said low pressure port, and a second liquid trap filter element contained in said outlet compartment interposed between said inlet and said outlet of said outlet compartment.
- 7. The liquid separator according to claim 6,
 wherein said outlet compartment includes a barrier
 interposed between said second filter element and said
 low pressure port, said barrier defining said outlet
 port of said outlet compartment.
- 1 8. The liquid separator according to claim 6, 2 wherein said second filter element comprises a 3 membrane bearing a polytetrafluoroethylene laminate.
- 9. The liquid separator according to claim 1, and including a self-sealing filter in at least one of said sample outlet port and said low pressure port.

1	10. A liquid separator for a gas analyzer, said
2	liquid separator comprising:
3	a sample inlet port;
4	a sample outlet port;
5	an inlet compartment having an inlet in fluid
6	communication with said sample inlet port for
7	receiving a das sample introduced into said sample
8	inlet port, said inlet compartment having an upper
9	outlet communacated with said sample outlet port;
10	a liquid collection chamber in fluid
11	communication with said inlet compartment for
12	receiving liquid from said inlet compartment;
13	a low pressure port;
14	an outlet dompartment interposed between said
15	collection chamber and said low pressure port, said
16	outlet compartment having an inlet communicated with
17	said collection chamber and an outlet communicated
18	with said low pressure port; and
19	a gas permeable, liquid impermeable filter
20	element contained in one of said inlet compartment and
21	said outlet compartment, interposed between said inlet
22	and outlet of said one compartment for substantially
23	preventing flow of liquid while allowing the flow of
24	gas from said inlet to said outlet of said one
25	compartment.
1	11. The liquid separator according to claim 10,
. 2	wherein said filter element is contained in said inlet
3	compartment interposed between said sample inlet port
4	and said upper outlet for separating liquid from the
-+	and said appear outles for separating induce from the

gas sample.

5

1 2

3

1 2

3

1

3



- 1 12. The liquid separator according to claim 10,
 2 wherein said filter element is contained in said
 3 outlet compartment interposed between said inlet of
 4 said outlet compartment and said outlet of said outlet
 5 compartment for substantially preventing the passage
 6 of liquid through said outlet compartment to said low
 7 pressure port.
 - 13. The liquid separator according to claim 10, wherein at least said one compartment includes a cover separating said inlet and outlet compartments.
 - 14. A liquid separator according to claim 10, wherein said filter element comprises a membrane bearing a polytetrafluoroethylene laminate.
 - 15. The liquid separator according to claim 10, including a self-sealing filter in at least one of said sample outlet port and said low pressure port.
- 1 16. A liquid separator for a gas analyzer, said 2 liquid separator comprising:
- 3 a sample inlet port;
- 4 a sample outlet port;
- an inlet compartment having an upper outlet communicated with said sample outlet and a lower outlet communicated with said collection chamber;
- a gas permeable, liquid impermeable filter

 element contained in said inlet compartment interposed

 between said sample inlet port and said upper outlet

 for separating liquid from the gas sample;
- said inlet compartment including a barrier
 interposed between said filter element and said sample

```
outlet port, said barrier defining said upper outlet;
14
15
    and
         a liquid collection chamber for receiving liquid
16
    passed through said lower outlet of said inlet
17
18
    compartment.
              The liquid separator according to claim 16,
    including an outlet compartment interposed between
    said collection \chamber and said low pressure outlet,
    said outlet compartment having an inlet communicated
 4
    with said collection chamber and an outlet
 5
    communicated with said low pressure port, and a second
 6
    gas permeable, liquid impermeable filter element
 7
    contained in said outlet trap filter compartment
 8
    interposed between s \stackrel{.}{a} \text{id} inlet and said outlet of said
 9
10
    outlet trap filter compartment.
              The liquid separator according to claim 17,
 1
    wherein said first-mentioned and said second filter
 2
    elements each comprises a \membrane bearing a
 3
    polytetrafluoroethylene laminate.
 4
```

1 19. A liquid separator for a gas analyzer, said 2 liquid separator comprising:

- 3 a sample in et port,
- 4 a sample out let, port;
- 5 a liquid collection chamber;

a separation compartment for separating liquid
from the gas sample, said separation compartment

8 having an upper outlet communicated with said sample

outlet port and a lower outlet communicated with a

10 collection chamber;

9

11 a low pressure port λ and

 ω^{λ^1}

3

5

6 7

8

9

14

15

16

18

19

20

21

22



an outlet compartment interposed between said 12 collection chamber and said low pressure port, said 13 outlet compartment baving an inlet communicated with 14 said collection chamber and an outlet communicated 15 with said low pressure port, and a gas permeable, 16 liquid impermeable filter element contained in said 17 outlet compartment interposed between said inlet and 18 said outlet of said outlet compartment. 19

> 20 A liquid separator for a gas analyzer, said liquid separator comprising:

- a sample in et port;
- 4 a sample outlet port;

an inlet compartment for receiving a gas sample introduced into said sample inlet port, said inlet compartment having an upper outlet communicated with said sample outlet port and a lower outlet communicated with said collection chamber;

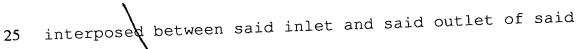
a first gas permeable liquid impermeable filter
element contained in said inlet compartment interposed
between said sample inlet port and said upper outlet
for separating liquid from the gas sample;

a liquid collection chamber receiving liquid passed through said lower outlet of said inlet trap filter compartment;

17 a low pressure port;

an outlet compartment interposed between said collection chamber and said low pressure port, said outlet compartment having an inlet communicated with said collection chamber and an outlet communicated with said low pressure port; and

23 a second gas permeable, liquid impermeable filter 24 element contained in said outlet compartment



26 outlet compartment.